



SR 527

ROUTE DEVELOPMENT PLAN

MP 6.62 (164TH ST. S.E./MILL CREEK ROAD)

TO

MP 11.87 (JCT. I-5)

WASHINGTON STATE DEPARTMENT OF TRANSPORTATION

DISTRICT NO.1

BELLEVUE WASHINGTON

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EXECUTIVE SUMMARY

SR 527 is located in southwest Snohomish County and lies east of I-5. It connects SR 522 (Bothell) on the south and I-5 (Everett) on the north and is about twelve miles long. Due to its length and certain areas of intense development, the roadway has been divided into three segments. This segment of the route development plan runs from MP 6.62 (164th Street SE Mill Creek Road) to MP 11.87 (Jct. I-5) which is about 5.25 miles long. Mill Creek is the nearest incorporated city on the southern terminus and the northern terminus lies within the city limits of Everett.

Currently SR 527 functions as a principal arterial highway. Developments within the corridor are mostly residential and commercial. There has been a large increase in traffic volumes and future growth is forecast to increase at a 3.5% annual rate. The route development plan is targeted for year 2010. The route development plan for this segment of SR 527 recommends the widening of the existing roadway to five lanes throughout its entire length with channelization at various intersections. A plan for channelization of various intersections is included in this report. However, because such detail is not appropriate to a long range plan, channelization plans will not be included in future reports.

INTRODUCTION

This study of SR 527 is part of the State of Washington (WSDOT) District 1 long range route development planning program. These plans are intended to identify the improvements needed to attain a desired level of service at a future date. Segment three of SR 527 is the subject of this report.

Route development plans are being processed for the entire length of SR 527. The route has been divided into three segments.

Segment 1 - Jct. SR 522 (Bothell) to I-405 (MP 0.00 to MP 2.69)

Segment 2 - I-405 to 164th SE/Mill Creek Road (MP 2.62 to MP 6.62)

Segment 3 - 164th Street SE/Mill Creek Road to I-5 (MP 6.62 to MP 11.87)

When approved, this long range plan will provide guidance for development of the District's program of projects as well as guiding developer impact mitigation measures.

This plan has been prepared in cooperation with local jurisdictions and agencies. Early in the planning process a scoping meeting was held with interested local officials and staff. Throughout the project, relevant plans of affected cities, transit authorities, council of governments and counties were reviewed for consistency. Any significant differences were discussed. Reports were then prepared with circulation to local agencies for review and comment. Final approval will be issued by Headquarters in Olympia.

BACKGROUND

SR 527 is classified as a principal arterial highway for its entire length per the 1986 Highway Functional Classification Plan. This segment of SR 527 is 5.25 miles long and lies east of I-5. The highway traverses generally level terrain. Mile post stationing runs from south to north while highway stationing runs from north to south. Mill Creek and Everett are the closest incorporated cities on this segment of highway. The 1986 Level of Development Plan calls for SR 527 to meet 3 standards between 164th Street SE and the SR 5 Junction.

The predominant zoning classifications adjacent to SR 527 are commercial and residential.

Based upon traffic projections and predicted land use development, those areas having a 3R designation should be reevaluated and raised to the P-6 Highway Functional design level. A 5-lane configuration meeting designated standards is proposed for this segment of the route development plan (see attached roadway section for lane and shoulder widths)

Vicinity Map

ROADWAY SECTION

NUMBER OF LANES

The existing roadway sections for this segment of SR 527 varies from two to five lanes with shoulders on both sides of the highway. The lane widths are 11-12 feet wide and shoulder width varies from 4 feet to 8 feet wide. Following is the breakdown by mile post numbers and their respective roadway dimensions:

- 1) MP 6.62 (Jct. 164th St. SE) to MP 6.80 (Jct. 161st SE) 4-11' lanes and 2-8' shoulder.
- 2) MP 6.80 (Jct. 161st St. SE) to MP 7.00 (Jct. Mill Cr. Blvd.) - 3-11' lanes and 2-8' shoulder.
- 3) MP 7.00 (Jct. Mill Cr. Blvd.) to MP 10.00 (just north of 116th St. SE) - 2-11' lanes and 2-8' shoulder.
- 4) MP 10.00 to MP 10.18 - 2-11' lanes, 1-12' TWLTL and 2-8' shoulder.
- 5) MP 10.18 to MP 10.32 (Jct. Silver Lake Rd.) - 2-11' lanes and 2-8' shoulder.
- 6) MP 10.32 (Jct. Silver Lake Rd.) to MP 11.39 (Everett) 5-11' lanes and curbs.

The 1988 AADT for this segment of SR 527 ranges from 10,700 uph to 17,200 uph. At the present time, there are no bicycle or bus routes. No projects have been scheduled for the 1989-1991 biennium.

A level of service (LOS) analysis was performed on different sections using the p.m. peak hour traffic volumes for the year 2010 on the existing 2 lane roadway. A LOS "E" was calculated throughout the entire segment for both periods of time.

Also a level of service analysis was performed on the same sections of the project using the same projected p.m. peak hour volumes for the year 2010 with the proposed 5-lane roadway section. Level of service "C" and "D" were calculated throughout the entire segment.

The 5-lane design section being proposed for this segment of the highway should be adequate for handling future traffic.

RIGHT-OF-WAY WIDTHS

The current goal is to establish a 100 foot right-of-way strip along the entire highway corridor per RCW Chapter 47.28.020 (State R/W width). In addition, topography problems may require the acquisition of slope easements in a number of areas if desirable design guidelines are to be met. Land developers fronting the highway will be asked to contribute R/W as necessary in order to establish the 100 foot R/W strip as well as any needed slope easements.

LANE AND SHOULDER WIDTH

A 5-lane roadway section with 2-11 foot wide through lanes in each direction, a 12 foot wide two-way left turn lane and 8 feet of shoulder on each side of the roadway for a total of 72 feet is being proposed. Also in areas where sidewalk is being utilized, a 5-lane roadway section with 2-11 foot wide through lanes, a 12 foot wide TWLTL, 3-6 feet of shy distance and a 5-6 foot wide sidewalk on each side of the roadway for a total of 73-81 feet is proposed depending on the local jurisdiction (city or county). These roadway dimensions are in accordance with accepted WSDOT standards for principal arterials of the P-6 design class. This section runs throughout the entire length of the segment. In sections without curb and gutter, K-curb is required to control access. No improvements are anticipated between 112th St. SE to I-5 at this time. No bridge and other structure are being proposed.

CURB, GUTTER AND SIDEWALKS

In the urban areas the provision of curb, gutter and sidewalk is dependent upon the desires of the local agency (city or county) and the need to protect pedestrians in high use areas. Everett's proposed Silver Lake Shoreline Management and Access Plan is intended to enhance the lake's attractiveness as a public recreational resource and facility. This plan, when combined with the increasing number of multifamily residential developments in the Silver Lake vicinity, will draw a substantial number of pedestrians to the lake. The volume of pedestrian traffic along SR 527 near the lake will undoubtedly warrant the construction of curb, gutter and sidewalk on both sides of the highway. The City of Mill Creek and Snohomish County will likely pursue the provision of curb, gutter and sidewalk within their respective areas of jurisdiction also. To maintain consistency with the design for SR 527 south of 164th Street SE, a curb, gutter and sidewalk section will only be used at intersections, in existing developed areas or in areas of high pedestrian potential such as along Silver Lake. Although the design speed is 40 mph, the nature of development as described above, requires curbs, gutters, and/or sidewalks in certain areas.

LEVEL OF ACCESS CONTROL PROPOSED

SR 527 is not designated for any access control per the Master Plan for Limited Access Control. However, we are proposing a form of negotiated access control in the subject area. This form of access control is being implemented and considered in the other segments of the highway. Access control is considered an important alternative to further widening as both Snohomish County and the Washington State Department of Transportation are concerned about the degradation and functional obsolescence that SR 527 would suffer without imposing such restrictions. Because of the type of land developments that will be constructed along SR 527, limiting access through internal road networks is feasible. Snohomish County, in coordination and cooperation with the WSDOT, is controlling new land development access through approval of the site development plans.

The land developers have been cooperating in a process of implementing access management controls as a trade-off in negating the need for any additional traffic lanes beyond the proposed five-lane design. The number of design and location of access points (driveways) would be specified through this process.

INTERCHANGES

Since SR 527 is designated as a non-access control highway, no interchanges are planned. Signals should be sufficient to assure reasonable movement of traffic.

INTERSECTIONS

CONCEPTUAL CHANNELIZATION PLAN

Existing intersection alignments will generally remain as existing except at the intersections of 138th Street SE, 16th Avenue, and 132nd Street SE which should be re-aligned. All existing intersection radii should be revised except 132nd Street SE which has recently been reconstructed by Snohomish County. Proposed intersection data is as follows:

Name	M.P.	Type	Angle of Intersection	Rt. Corner Radii	Lt. Turn Radii
164th Avenue SE	6.62	4-Way	90°	45' to 55'	45' to 55'
Exit/Ent Shopping Center	6.71	Westside T	90°	55'	55'
161st Street SE	6.80	Westside T	90°	55'	55'
Mill Creek Blvd.	7.00	4-Way	90°	55'	50'
Village Green Drive	8.12	Eastside T	90°	55'	50'
138th Street SE	8.25	Eastside Y	App.65°	35' to 55'	50'
136th Street SE	8.37	4-Way	App.82°	55'	50'
16th Avenue	8.63	Westside Y	App.65°	55'	50'
132nd Street SE	8.85	4-Way	App.50°	55'	30' to 75'
129th Place SE	9.01	Eastside T	90°	55'	50'
126th Street SE	9.23	Westside T	90°	55'	55'
124th Street SE	9.36	Eastside T	90°	55'	55'
122nd Place SE	9.45	Eastside T	90°	55'	55'
120th Place SE	9.57	Eastside T	90°	55'	50'
Lk. Height Drive	9.78	Eastside T	90°	55'	55'
116th Street SE	9.89	Eastside Y	App.38°	35' to 55'	30' to 55'
112th Street SE	10.39	Westside T	App.82°	50'	55'

No provisions for right turn lanes were made on the geometric plans other than for the 164th Street SE and Mill Creek Blvd. vicinity. Right turn drop lanes will be added to the geometric plan as needs are identified.

All intersections meet the minimum turning radius for "P" passenger vehicles, SU single unit trucks or WB-40 type trucks. A brief discussion of geometrics, intersections that should be revised and their desired amenities are as follows:

164th Street SE To Mill Creek Blvd.

This 3-lane and 4-lane section was approved by Headquarters August 24, 1979 and built by a developer the following year. The area has since been incorporated and is now in the City of Mill Creek. The city has expressed a desire to upgrade this section to 5-lanes. The acquisition of R/W will be a determining factor in the roadway expansion. Originally a 5-lane section was contemplated but was scaled down to 3 lanes when United Development Corporation (UDC), the land developer, asked for reconsideration due to topography problems, R/W costs, and construction costs. In return for the scaled down version, access control was negotiated as a trade-off in negating the need for 5-lanes. However, WSDOT would be agreeable to a 5-lane design if the city would present a roadway widening proposal along with its concept for obtaining any additional R/W necessary to accommodate the widening.

Village Green Drive

This eastside "T" type intersection and channelization plan was approved by WSDOT District 1 on March 1, 1985. Heatherwood Drive is 100 ft. north of the Village Green Drive and intersects SR 527 on the west side. Its traffic generating future is limited by platting and geography. Nevertheless, this divided intersection needs to be re-aligned. If Heatherwood Drive develops beyond expectations, then Village Green Drive should be moved northward to create a common alignment with it.

136th Street SE (Dumas Road)

This is a four-way intersection. The roadway to the west is used as a cut off road to the 128th Street/I-5 connection. The channelization plan was approved by Headquarters on October 8, 1985. Existing 136th Street SE was extended easterly from SR 527 per approved channelization plan. The new roadway extension is to be utilized as an access to a new housing development in the area.

16th Avenue

This intersection is a westside "Y" type. This street is a cutoff street to/from 132nd Street SE westbound. The angle of intersection is approximately 65° and the corner right turn radii is 55 feet. The proposed left turn radii is 50 feet. This roadway is used by eastbound motorists desiring to turn right at 132nd Street SE and SR 527. The existing right of way width for this street is 85 feet. In the future, if development is experienced along this road, the angle of intersection should be improved to an acceptable angle.

132nd Street SE

This is a major, 4-way type of intersection. The channelization plan was approved by Headquarters on July 8, 1983. This intersection has been reconstructed recently with two through lanes and a left-turn lane in each direction on 132nd Street SE. The remaining corners and turning radii meet design standards. In the future, if development is experienced along this road, the angle of intersection should be improved to an acceptable angle.

116th Street SE (Green Lantern Road)

This intersection is an eastside "Y" type. It is a major intersection. The existing street right of way is 60 feet. This intersection was recently reconstructed by the city of Everett using hazard elimination and developer funds. The work included the installation of signal.

112th Street SE to 94th Street SE

These intersections are located in the City of Everett and would remain as presently constructed.

NEED FOR SIGNALIZATION

There are seven intersections within this corridor that have existing signals, 164th Street SE, Mill Creek Blvd., 132nd Street SE, 116th Street SE, 112th Street SE, 110th SE and the SR 5 NB off-ramp to SR 527. The existing signals at the intersections of 116th Street SE, 112th St. SE and 110th St. SE are under control of the City of Everett. The intersection of Village Green Drive is on the signal priority list and signal may be installed when warrant is met and fund is available. Signal at Village Green Drive to be funded by School District when Heatherwood School is constructed.

ROADWAY CHARACTERISTICS

DESIGN SPEED

The proposed design speed for this segment is 50 mph.

Following is a list of all horizontal curves within the corridor and their corresponding design speeds:

Hor. Curve No.	<u>STATION</u>		Design Speed
	PC	PT	
			WSDOT
1	444+27.2	445+97.9	30 MPH
2	431+43.0	434+76.3	49 MPH
3	407+13.8	409+79.8	45 MPH
4	387+68.3	300+30.7	33 MPH
5	377+91.0	379+84.7	48 MPH
6	371+13.0	375+83.0	45 MPH
7	359+99.3	362+19.3	45 MPH
8	341+01.5	347+01.5	37 MPH
9	330+67.0	334+34.4	30 MPH
10	287+09.3	288+70.1	30 MPH
11	281+35.6	383+68.9	49 MPH
12	276+83.8	279+00.5	30 MPH
13	274+75.3	275+90.3	30 MPH
14	269+54 PCC	272+49.2	30 MPH
15	267+92.7	269+54 PCC	30 MPH
16	263+86.4	266+19.4	30 MP
17	253+15.5	257+54.6	30 MPH

Many of the curves of this segment do not meet the 50 MPH design speed. However, curves less than 45 MPH have been checked with the Ballbank and will be posted for advisory speed accordingly.

Accident History

Following are the Accident Data Listings of SR 527 and the State average rates for the period of four years (1982-85).

<u>Location</u>	<u>Period</u>	<u>SR 527 Fatality Rate</u>	<u>SR 527 Accident Rate</u>	<u>State Average Fatality Rate</u>	<u>State Average Accident Rate</u>
MP 6.62 (164th St. SE)	1982-85	10.1	5.1	1.8	1.8
MP 8.85 (132nd St. SE)	1982-85	4.6	5.5	1.8	1.8
MP 10.39 (112th St. SE)	1982-85	--	1.4	1.8	1.8

In this segment of SR 527 there were two (2) fatal accidents, 76 injury accidents and 113 property damage accidents during this same period of time. These fatal accidents occurred at non-intersection curves in clear weather. The types of fatal accidents were an overturned vehicle and a collision between a parked vehicle and one moving. The types of injury accidents were rear-ended, side-swiped and struck fixed objects. Most of these accidents occurred in the areas where the shoulder was too narrow (4'-6' wide). We are proposing a wider shoulder for the entire segment which will help alleviate the accident problem.

SIGHT DISTANCE RESTRICTIONS

The horizontal alignment has numerous curves, especially in the vicinity of Silver Lake, which has seven curves between Sta. 253+15.5 to Sta. 288+70.0. However, the existing alignment and grades will be maintained.

HIGHWAY OCCUPANCY VEHICLE (HOV) TREATMENT

At this time no HOV treatment is considered to be warranted. At a future time, if transit service is established, HOV priority treatments could be implemented at critical intersections. Currently two park and ride lots are located in the vicinity of this segment of SR 527. One is located at 32st St. and 132nd St. SB and the other is at 19th and Burley.

MISCELLANEOUS

PEDESTRIAN FACILITIES:

Within this segment of the highway (164th Street SE to I-5) sidewalks will be considered within the city limits of Mill Creek and selected areas such as 132nd Street SE and 116th Street SE. The sidewalks would be 5 feet wide except where Snohomish County has asked for wider sidewalks and is able to acquire the necessary R/W.

BIKE PATHS/LANES

Under the 5-lane proposal, the shoulder will be 8 feet wide. These shoulders will be sufficient for usage by both bicyclists (Class IV Shared Roadway) and pedestrians. In those areas where either sidewalks or K-curb is used, a 3-6 feet shy distance will be provided depending upon the local jurisdiction. This shy distance can be used by bicyclists.

BUS PULLOUTS

Community Transit does not have an existing bus route along SR 527 between 164th Street SE and I-5. However, Everett Transit does have an existing bus route north of 112th St. SE. If the bus route is initiated south of 112th St. SE in the future, provisions for transit pull-outs will be coordinated with Community Transit.

LAND DEVELOPER PARTICIPATION

All new land developments will be expected to mitigate their respective traffic impacts to SR 527. Mitigation measures may include R/W donations, slope easement donations, access management controls and the funding and construction of roadway improvements. Depending upon the particular traffic impact, a land developer could be expected to do one or all of the above mentioned. The WSDOT Developer Policy should be referred to for guidance.

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